

## General factors affecting solubility

1) The  $K_s$  of aluminium hydroxide,  $\text{Al}(\text{OH})_3$ , at  $25^\circ\text{C}$ , is  $3 \times 10^{-34}$ , indicating that it has very low solubility. The solubility may be altered by changes in pH (due to acidic or basic properties) and formation of complex ions such as the aluminate ion,  $[\text{Al}(\text{OH})_4]^-$ .

Discuss why aluminium hydroxide becomes more soluble in aqueous solutions that have a pH less than 4, or a pH greater than 10.

In your answer include:

- the equation for the reaction that relates to  $K_s(\text{Al}(\text{OH})_3)$
- equations for the reactions that relate to changes in the solubility of aluminium hydroxide at pH less than 4 or greater than 10
- a discussion of the equilibrium principles involved.

2) The solubility product,  $K_s$ , of  $\text{AgCl}$  has a value of  $1.56 \times 10^{-10}$  at  $25^\circ\text{C}$  and this value increases to  $2.15 \times 10^{-8}$  at  $100^\circ\text{C}$ .

Explain why  $K_s$  is higher at  $100^\circ\text{C}$ . Include reference to the relevant equilibrium equation in your answer